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Employee Health Program

A Proposal for the Eighties

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Employee Health Program

A Proposal for the Eighties



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Abstract

Programs that focus on preventing illness are fast gaining favor within the Federal Government. This report describes three basic types of employee health programs that are in use: health risk analysis (HRA), laboratory screening tests, and medical examinations. It briefly describes each and shows how the three can be integrated into a single complete employee health program. The HRA concept is the cornerstone of this integrated program because it focuses on "wellness" early in an employee's career. The report outlines how to establish such an integrated health program and evaluate resulting improvements in employee health. It also makes recommendations for initiating a program throughout the Forest Service.

A report on Equipment Development and Test Project 0404, Employee Health Program, funded by the Safety and Health Group.

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Government and industry have long recognized that people are their greatest resource. For many years progressive companies have had excellent employee health programs. Federal agencies, too, are now developing programs for their employees.

The 1979 Surgeon General's report on health promotion and disease prevention, titled *Healthy People*, reflects the consensus of leaders in the scientific and health community for a reordering of national health priorities, shifting the balance from expensive technological treatment to disease prevention and promotion of good health. The report cites a recent study that suggests as much as half of the U.S. mortality in 1976 was due to unhealthy behavior or lifestyle. It further states that, "often only modest lifestyle changes are needed to substantially reduce risk for several diseases."

Section 7901 of the U.S. Code authorizes departments and agencies to develop health programs, including those emphasizing disease prevention and health promotion. Several Executive Orders have underscored this intent. Additional authorities for Federal agency employee health programs are included in appendix A.

The Forest Service accelerated its quest for prudent employee health programs in 1978. The Missoula Equipment Development Center (MEDC) was asked to conduct a pilot employee health education (illness prevention) program. The Center also was asked to investigate and recommend schedules for: (1) periodic em-

ployee medical examinations, and (2) laboratory screening tests for early detection of diseases and disorders. The Forest Service was primarily interested in programs that emphasize prevention of illness, individual responsibility, and cost effectiveness.

This report is divided into sections that briefly describe three basic types of employee health programs for prevention, early detection, and periodic medical examinations. It reports in detail the results of MEDC's pilot health program. The report also describes how to implement and evaluate programs and discusses the potential value to employees and the employer.

Prevention: Health Risk Analysis

It's what you do hour by hour, day by day, that largely determines the state of your health; whether you get sick, what you get sick with, and perhaps when you die.
— L. Breslow, M.D.

Health Risk Analysis (HRA), also called Health Hazard Appraisal, is based on the pioneering work of Drs. Robbins and Hall in preventive medicine. It is founded on the premise that the causes of many degenerative diseases are products of life-style or poor health habits. By identifying bad habits early and modifying behavior, the risks of death can be reduced.

Project Life/Style

The Missoula Center designed a pilot employee Health education (illness prevention) program - Project Life/Style - to evaluate the health risk analysis concept in the Forest Service. During the summer and fall of 1978, 100 Missoula-based Forest Service volunteers participated in the pilot program. Participants were drawn from a wide range of job classifications and grades.

The object of our pilot HRA program was to evaluate the effectiveness and costs of the HRA approach, to assess employee response, and to see how the HRA and followup programs such as those addressing problems like smoking, stress and weight reduction, and fitness contribute to changes in health habits and health risk.

Our pilot program, and typical HRA programs, have a data gathering phase and a data analysis phase. The first includes taking a blood sample and having participants fill out a questionnaire about their personal health history and habits. The second entails a computer analysis of the blood sample and health information. Next, a physician reviews this data. Participants are then counseled and referred to further medical examinations or health modification programs. Also, our program included a study of the correlations between high density lipoprotein cholesterol (HDL) in the blood and related factors (diet, exercise, alcohol), plus a followup 6 months later.

Initially, Life/Style volunteers were able to select one of two days for blood tests and for turning in their HRA questionnaire. Before the blood test, they were instructed to fast for 12 hours.

Interhealth of San Diego was contracted to conduct the HRA and blood analysis, which included 19 tests and HDL, the best single indicator of heart disease risk¹ (tables 1, 2). Interhealth was chosen because it was able to do both the blood analysis and Health Risk Analysis. (See appendix B for bid solicitation material.)

The contract also called for Interhealth to provide the Health Risk Analysis questionnaire and a summary of the results. Total cost for each Life/Style volunteer was \$30: \$10 for the HDL test, \$10 for the 19 other blood tests, \$10 for analysis of the questionnaire. (See appendix C for the HRA questionnaire, sample health risk profile, and laboratory results.)

¹ HDL transports cholesterol to the liver for elimination. As HDL goes up, the risk of heart disease goes down. When the level reaches 75 milligrams per hundred milliliters, the risk of heart disease is virtually eliminated (Castelli 1977). Heart disease risk increases as low-density lipoprotein cholesterol LDL levels rise. LDL is found in diseased coronary arteries.

Dr. John Bruckner, M.D., screened all HRA and blood sample results and contacted individuals in need of medical followup. Dr. Bruckner and the author conducted group counseling sessions to explain HRA and blood chemistry findings, interpret HRA results, and discuss ways to decrease the risk of death.

Each individual was then scheduled for a private counseling session with either Bruckner or Sharkey to discuss diet, exercise, or other problems. A packet of information on health-related matters, courtesy of the President's Council on Physical Fitness and Sports and the American Heart Association, was given to each participant.

The volunteers were then invited to an optional session for diet, body fat, physical activity, and fitness evaluation. Thirty men volunteered from the original group. The results of these additional evaluations were computer analyzed to determine their relationship with HDL and the risk of heart disease. They were also used to further motivate participants to improve their health habits.

Participants in need of stress or weight reduction and those who wanted to stop smoking were invited to join organized programs; those who needed more exercise were invited to join a fitness program. All programs were conducted at the University of Montana. Before enrolling in the fitness program, participants were given medically supervised electrocardiograms while resting and during exercise.

Table 1. — Predicting heart disease risk from blood lipids

<i>Blood lipid</i>	Predictive ratios¹	
	<i>Men</i>	<i>Women</i>
Triglycerides	0.51	9.52
Cholesterol	1.98	2.26
LDL cholesterol	4.39	4.53
HDL cholesterol	14.03	21.21
<i>Combinations</i>		
LDL, Chol, Tri	8.26	19.69
HDL, Chol	17.11	20.41
HDL, LDL, Tri	18.90	24.73
HDL, Chol, Tri	19.19	24.21

Source: W.P. Castelli et al. 1977, based on data from Framingham, Mass., epidemiological study

¹Values above 9.5 significant beyond .01 level

Table 2. — HDL cholesterol and heart disease risk

HDL cholesterol (mg/100 ml)	Heart disease risk	
	<i>Men</i>	<i>Women</i>
75	"Longevity Syndrome" ¹	
70	— ²	0.52
65	0.45	0.64
60	0.55	0.80
55	0.67	1.00 ¹ (standard risk)
50	0.82	1.25
45	1.00(standard risk)	1.55
40	1.25	1.94
35	1.50	—
30	1.75	—
25 or below	2.00	—

Source: W.P. Castelli et al. 1977, based on data from Framingham, Mass., epidemiological study

¹Longevity syndrome (HDL 75/ml or above) in Framingham study meant no incidence of heart disease among subjects

²Sample too small for accurate prediction

Project Life/Style Results

Blood Chemistry

Blood profiles were analyzed for 99 people: 74 men and 25 women (1 person had dropped out of the program) (table 3). Twenty-one individuals were notified of conditions that deserved followup, such as elevated triglyceride or cholesterol levels, both considered factors in heart disease, and abnormal blood pressure. Several blood pressure readings were rechecked by Dr. Bruckner and found to be within acceptable standards.

Health Risk Analysis(HRA)

Health risk analyses were run on the 99 Life/Style volunteers. The average age of the group was 42.5 years. When information considering lifestyle and health habits, such as diet, exercise, and smoking was computer analyzed, the average risk age was 39.5 years, a reduction of 2.7 years. This showed that the Forest Service employees who participated in the program were healthier than individuals of similar age, sex, and race throughout the country. Thus, the average 42-year-old employee in this sample was statistically as healthy as someone 39½ years old.

The analysis showed that these employees could further reduce their risk age to an average achievable age of 36.7, a reduction of 2.8 years, by improving their health habits. Because HRA is used to indicate the probability of death in the next 10 years, a reduction in risk age is a favorable prognosis for more years of productive employment with far less chance of lost time or early retirement.

Table 3. — Abnormal or borderline blood chemistry findings

<i>Blood test</i>	-----MEN-----				-----WOMEN-----			
	<i>No. Abn</i>	<i>% Abn</i>	<i>No. Bord</i>	<i>% Bord</i>	<i>No. Abn</i>	<i>% Abn</i>	<i>No. Bord</i>	<i>% Bord</i>
Calcium	0	0	0	0	0	0	0	0
Glucose fasting	2	3	0	0	0	0	1	4
Bun (urea nitrogen)	0	0	4	5	0	0	2	8
Uric acid	3	4	3	4	0	0	0	0
Cholesterol	1	1	7	9	0	0	3	12
Total protein	0	0	1	1	0	0	0	0
Albumin	0	0	0	0	0	0	0	0
Total bilirubin	2	2	6	8	0	0	0	0
Alkaline phosphatase	0	0	1	1	0	0	0	0
LDH	0	0	2	3	0	0	0	0
SGOT	0	0	0	0	0	0	0	0
Globulin	0	0	1	1	0	0	0	0
Creatinine	0	0	0	0	0	0	0	0
SGPT	0	0	1	1	0	0	0	0
Triglycerides	12	16	8	10	0	0	0	0
Serum-iron	3	4	0	0	2	8	1	4
Inorganic phosphate	1	1	8	10	0	0	1	4
HDL	9	12	0	0	0	0	0	0
Sodium	0	0	4	5	0	0	2	8
Potassium	0	0	6	8	0	0	2	8

Note: A number of men had abnormal borderline cholesterol, triglyceride, or HDL levels. Three women had low iron levels; two women and six men had borderline potassium levels, a frequent finding among patients taking diuretics for blood pressure control.

Blood chemistry findings for management and staff groups were similar.

See appendix C for description of blood tests.

For some analyses, employees were classified as management or staff. The data indicated that a manager drinks somewhat more, smokes less, gets more vigorous exercise, has less hypertension, and a greater reduction in risk age, 3.5 years vs 1.9 years for staff. Table 4 summarizes probable causes of death for management and staff employees participating in the program.

Table 4. — Probable causes of death for management and staff employees participating in Project Life/Style

Management (53)		Staff (46)	
Arteriosclerotic heart disease		Arteriosclerotic heart disease	
Suicide		Suicide	
Auto accident		Cancer of the lungs	
Cirrhosis of the liver		Cancer of the breast	
Cancer of the intestines or rectum		Cancer of the intestines or rectum	
Cancer of the lungs		Auto accident	
Stroke		Stroke	
Homicide		Cirrhosis of the liver	
Pneumonia		Homicide	
Machinery accident		Cancer of the ovaries	
Bronchitis and emphysema		Pneumonia	
Cancer of the breast		Bronchitis and emphysema	
Cancer of the stomach		Machinery accident	
Cancer of the ovaries		Cancer of the cervix	
Poisoning		Poisoning	
Aircraft accident		Aircraft accident	
Rheumatic heart disease		Cancer of the stomach	
Cancer of the cervix		Drowning	
		Rheumatic heart disease	
		Diabetes	
		Leukemia	
		Hodgkins disease	
Average current age	= 43.42	Average current age	= 40.45
Average current risk age	= 39.93	Average current risk age	= 38.62
Average achievable age	= 37.77	Average achievable age	= 35.06

Note: Causes of death in descending order of health risk.

Additional Evaluations

As stated, 30 men from the original sample volunteered for additional testing. Body fat, dietary analysis, physical activity, and fitness were examined to show what effect they had on high density lipoprotein cholesterol (HDL). It was found that HDL cholesterol levels were highly related to the weekly amount of intense physical activity (above 7.5 cal/min) but not to total activity (table 5).

The greater the amount of vigorous activity per week, the higher the HDL. As body weight goes up, the HDL level declines, and as diet moves toward low-fat consumption, HDL goes up. Aerobic fitness and percent body fat approached statistically significant relationships. As body fat goes up, HDL goes down; but fitness and HDL go up together. Contrary to other studies, this study showed alcohol consumption was not related to HDL levels, perhaps because few participants were heavy drinkers, and the sample size was small.

Then diet, percent fat, body weight, alcohol, fitness, and vigorous activity were used in combination to predict HDL. This analysis accounted for 46 percent of the variability in HDL.² Undoubtedly, heredity and factors not measured in this study account for the balance of the variability in HDL. So while genetic factors play an important role in HDL levels, health habits, including a low fat diet, desirable body weight, reduced percent body fat, and regular vigorous activity, influence HDL and the risk of cardiovascular disease. The genetic trait that provides the protection of high levels of HDL may only occur in 1 family in 500.³ Fitness per se does not seem as important as regular vigorous activity. This is true probably because fitness itself is partially inherited and some people score higher in spite of relative inactivity.

Fitness Program

All individuals, whose HRA indicated the need for "supervised exercise" were invited to join a fitness program.⁴ They participated in a 12-week aerobic fitness program three times a week that used either distance running (3 to 4 miles) or sports as the primary type of exercise. Participants were instructed in warmup and cool-down exercises as well. Participants who attended sessions infrequently became an active control group for comparison with those who attended regularly.

The 14 participants in the distance running group increased HDL an average of 11.4 mg and oxygen uptake 7.7 ml per kg of body weight per minute (up from 50.8 mg and 40.5 ml respectively.) Both measures increased significantly compared to the sports and active control groups. Changes in HDL did not correlate statistically with changes in fitness, perhaps because of the initial levels of either HDL or fitness. There was a significant correlation ($r = .61$) between calories of vigorous exercise per week and changes in fitness (Confessore 1979).

Table 5. — Some correlates of HDL cholesterol in 30 men

Relationship to HDL	Correlation coefficient
Calories of intense physical exercise per week (7.5 cal/min)	.58 ¹
Body weight	-.39 ²
Fat in diet	-.38
Aerobic fitness	.36
Percent body fat	-.33
Alcohol	.21

¹ Statistically significant at .01 level of confidence

² Statistically significant at .05 level of confidence

² Multiple correlation coefficient (R) = .68; $R^2 = .46$

³ For more information on this phase of the project consult "Factors Associated with High Density Lipoprotein Cholesterol in Adult Males," unpublished M.S. thesis by Craig Simpson, University of Montana, 1979.

⁴ One male who did not elect to take the stress test and join the program suffered a fatal coronary 1½ years later. His HDL level was 29 mg and he was more than 60 pounds overweight.

The sports group played basketball and racketball regularly. The active control group ran 1 to 2 miles a week. These activities did not lead to significant changes in HDL or aerobic fitness. It appears that half-court basketball, beginning racketball, or occasional running lack the intensity, duration, or sustained effort to elicit a training effect or to favorably influence HDL.

Those who maintained a running schedule for 12 weeks were able to achieve a 40 percent reduction in heart disease risk (table 2) while burning 1,200 calories per week in vigorous exercise. This corresponds to the risk reduction reported by Paffenbarger (1977) in his study of Harvard graduates who burned at least 2,000 calories per week in vigorous exercise.⁵ However, the reduction was achieved in only 12 weeks of running three times per week. An increase to 5 or 6 days of exercise and 2,000 calories burned per week for several additional months could help to further reduce the risk.

Six Month Followup

Six months after administering the HRA and blood profile all participants were asked to complete a followup questionnaire (appendix D). Some 90 percent returned their questionnaires. The questionnaire asked for responses in three areas: participants' evaluation of the pilot program, lifestyle changes made, and additional followup or programs desired. Also, participants were invited to add comments on the back of the form.

Employee response to the program was enthusiastic (table 6). Individual counseling sessions received somewhat more favorable responses than group sessions, but all respondents agreed that the HRA and blood profile were useful. Many respondents added notes requesting annual followup with HRA and blood tests; many urged Servicewide adoption of the program, and a few asked that family members be included on a pay-as-you-go basis.

Table 6. — Six month followup

Program Evaluation

	<i>Very useful</i>	<i>Useful</i>	<i>Not useful</i>
Health risk analysis	59	30	0
Blood profile	60	20	1
Group session	25	48	2
Individual session	34	23	3
Program materials	32	48	2
Diet, fitness, fat evaluations	42	31	2

Lifestyle Changes

		None needed		Change needed		
		<i>None made</i>	<i>Some change</i>	<i>Significant change</i>	<i>% change¹</i>	
Diet	22	19	44	4	72.0	
Body weight	20	30	33	4	55.2	
Blood pressure	53	20	8	2	33.3	
Stress reduction	40	34	12	0	26.0	
Smoking	70	13	6	0	31.5	
Exercise	12	28	39	8	62.6	
Alcohol	58	27	4	1	15.6	
Seatbelts	33	37	17	3	35.0	

¹ For those who needed change

Additional Services Desired

Diet counseling	— 19	Exercise programs	— 41
Weight control	— 21	Fitness testing	— 28
Medical self-help	— 0	Stop smoking	— 5

⁵ Vigorous defined as over 7.5 calories per minute. Paffenbarger's study included a wide range of activities, including running.

The lifestyle or health habit changes reported by the volunteers in their questionnaires are subjective and do not necessarily mean positive changes in risk age. The questionnaire requested specific changes made in health habits. Responses included comments like: "reduced weight 5 pounds"; "participating in fitness program"; "using seatbelts on short trips"; "cutting down on salt"; "reducing fat intake."

The most notable changes in health habits were reported for diet (reduction in calories, cholesterol, and fatty food intake), exercise, and body weight. Viewed in the context of the total program, these changes are not surprising. We feel that the inclusion of HDL in the blood profile contributed to these changes.

Many participants took time to write comments and suggestions on the back of their questionnaire. The only negative response said: "Medical screening needs to be more comprehensive. Individual counseling bombed because of poor planning and insufficient time."

Positive comments ranged from simple thanks for the opportunity to participate, to extensive support and encouragement for Servicewide implementation of the program. Fifty-seven participants found the individual counseling useful or very useful; only three felt it was not.

Emphasizing the importance of HDL and recognizing the most effective ways to increase it — diet and exercise — and reduce heart disease risk were conveyed in program materials plus group and individual sessions. This information interested participants and many seemed excited about the potential for change. Only those participating in the distance running fitness program were able to observe changes in their HDL (increased 11.4 mg on average). Changes in other health habits, though not as dramatic, were significant in view of the numbers involved and the modest costs of the program.

Requests for additional followup services came in the diet, body weight, exercise, and fitness areas. Again, it appears that the information regarding HDL and heart disease risk can be credited with much of this interest. These findings emphasize the importance of the blood profile for motivating behavioral change. Motivation consists of arousing interest and directing action. Both HDL results and health risk computations, i.e., risk age arouse interest. The group and individual discussions plus program materials, such as the reprint from the February 1978 *Readers Digest* regarding HDL that was handed out, provided direction for appropriate action.

While some participants were able to enter an organized fitness program, at least 41 were not. Several participants suggested fitness programs be conducted at worksites. Others requested time on the job for health-related fitness activities. Except for special firefighting jobs, this has not been allowed in the Forest Service. But some Federal agencies do allow for job time exercise or worksite facilities.

In a February 1980 speech to the National Conference for Physical Fitness and Sports, President Carter urged:

All employers . . . to make facilities available for employee fitness programs, to encourage all Federal departments and agencies to support physical fitness programs, and that would include our military services as well.

The Secretary of Education and the U.S. Surgeon General also made statements to the Conference supporting physical fitness and health promotion.

Use of HRA Programs by Others

The HRA approach to disease prevention and health education has been used by other Government agencies. In a 12-month program conducted for the National Aeronautics and Space Administration, participants achieved a 1-year improvement in risk age. The Center for Disease Control is using HRA with 1,400 employees. The National Park Service is conducting a trial HRA program in its Western Region.

Within the Forest Service several programs are either in progress or under consideration. A total of 700 employees from the Pacific Northwest and Inter-mountain Forest and Range Experiment Stations participated in an HRA and blood profile program conducted in 1979 by the Portland Adventist Medical Center. This Health Hazard Appraisal program, conceived and developed by the Loma Linda (Calif.) University School of Health, is remarkably similar to the pilot project conducted by MEDC. Most organizations involved in health risk analysis use a common data base.

Followup programs were not available to Forest Service employees who took part in the Portland Adventist Medical Center program. For best results, an HRA program should include followup to reduce the health risk factor. These programs can be conducted by community organizations such as Weight Watchers, Overeaters Anonymous, YMCA or YWCA, health department, and adult education programs, or they can be privately contracted.

A few Federal agencies and many companies provide both health and fitness programs for employees. The Department of Justice provides a number of tests and an organized fitness program for its employees in Washington, D.C. Employees are allowed 1½ hours per week for fitness, and they have the use of a fitness facility, locker room, and showers.

The growth of health and fitness programs in the private sector has led to the creation of the American Association of Fitness Directors in Business and Industry.

Industry health and fitness programs typically include advice or programs on diet, weight loss, stress reduction, smoking, and alcohol consumption. Exercise is the backbone of the total health program. In his book *Lifeplan*, Donald Vickery, M.D., says: "How important is exercise? It may well be the most important thing you can do if you want to live a long and healthy life."

Costs

Costs for the HRA and blood profile analysis range from \$15 to \$30. Participants pay additional for followup programs. Followup prescribed by the program physician is covered by medical insurance. Health insurance companies are beginning to cover the costs of prevention programs as part of their total coverage. Here are two examples:

- Blue Cross of Montana is underwriting a Health Risk Analysis and followup program for school teachers in Missoula, Mont. Blue Cross covers one-half the cost; the school district and teachers share the balance. The HRA is conducted by the city-county health department at a cost of \$15 (extra for measuring HDL).

- Aetna Life & Casualty administers a plan for State employees in Michigan. HRA and numerous medical screening tests have been added as a fringe benefit to the State department of civil service-sponsored health insurance program.

⁶The more measures tested the greater the risk of false positive results. If the accuracy of each test is 95 percent and there are 20 tests, the chances of having an "abnormal" result approaches three out of four.

Some ways to reduce prevention program costs and increase benefits include:

- Negotiating HRA as part of health insurance coverage.
- Investigating low-cost or non-profit sources (health department, university, foundation) for HRA programs.
- Promoting cost-sharing between employee and employer.
- Testing large numbers of people.
- Reducing the number of tests in the HRA blood profile from 20 to an essential few (since most labs automate blood profiles it may not result in a savings).⁶
- Eliminating all but essential interpretive and health education materials with the HRA (saves \$4 per participant with one company).⁷
- Scheduling the HRA and blood profile in conjunction with periodic medical examinations.

- Developing a standard health program and followup materials for Servicewide use, including booklets and slide-tape or video-tape programs on stress reduction, nutrition, weight control, exercise (to lower costs and insure equal access to valid information).

- Computerizing health programs for nutrition-diet and fitness-weight control.

- Providing incentives for changing health habits.

- Inviting spouses to participate because health habit changes often require understanding and cooperation.

Another way to hold down costs would be to do the HRA and blood profile less often. Because the procedure calculates the risk of death during the next 10 years, it would be reasonable to repeat testing at 10-year intervals. Those with a high health risk could be tested more often.

Prevention programs like the HRA are most effective if they are given early in an employee's career rather than later when lifestyle changes are less apt to be made, and when these changes are less beneficial.

⁷ Public health agencies may provide HRA and blood profile at a lower cost

Early Detection of Disease: Periodic Health Screening and Testing

Federal regulations provide for voluntary periodic screening and testing of employees for diabetes, visual defects, glaucoma, cancer, hypertension, hearing defects, etc. (appendix E). Employees are referred to their private physicians for final diagnosis and treatment if screening or testing indicates the possibility of disease.

The World Health Organization (WHO) lists six criteria for determining when it is worthwhile to detect a disease before symptoms appear:

- The disease must have a significant effect on the quality of life.
- Acceptable methods of treatment must be available.
- Treatment during the asymptomatic (no symptom) period must significantly reduce disability or death.
- Treatment in the asymptomatic period must yield a superior result to treatment delayed until symptoms appear.
- Tests for detecting the condition in the asymptomatic period must be available at reasonable cost.

- The incidence of the disease in the population must be sufficient to justify the cost of screening.

Tests for very few diseases meet the WHO criteria for asymptomatic screening (Vickery 1978). Blood pressure tests, breast examinations, and Pap smears do. Routine medical examinations, diabetes screening, exercise stress tests, and X-rays for lung cancer do not. Table 7 lists screening tests and inoculations that meet the WHO criteria.

Table 7. — Schedule of screening tests and inoculations

Test for	All employees	Employees with personal or family history	Symptom/exposure of employees	Employees over 40	Test frequency or need
Blood pressure	X	X	—	—	Annual
Glaucoma	—	X	—	X	Every other year
Diabetes	—	X	X	—	Value uncertain
Vision	—	—	X	—	As needed
Hearing	—	—	X	—	Job related
Lung function	—	—	X	—	Job related
TB skin tests	—	—	X	—	As needed
Rectal exam	—	X	—	X	Every other year (especially men)
Thyroid	—	X	—	—	As needed
For Women Only					
Breast cancer	X	(frequent self exam)			Annual
Pap smear	X				Annual
Immunization Schedule					
Diphtheria		X			Only for high risk
Tetanus			X		For high risk
Rocky mountain spotted fever			X		as needed

Medical examination — as symptoms indicate or every 5 years

Laboratory screening tests have the most value when symptoms are present or the incidence of risk is high due to exposure, family history, or known risk factors. When used on individuals without symptoms, the predictive value of a screening procedure declines. In fact, the predictive value of most laboratory tests for screening is small. Greater predictive ability can be achieved by testing those with a high health risk, those with a family history of health problems, or other risk factors.

Thus, reason calls for a carefully selected and scheduled series of health tests. Shotgun approaches to periodic health screening are neither productive nor cost effective. As the number of screening tests goes up, the risk of false positive results climbs. A false positive result is an erroneous indication of the presence of disease. No screening tests are 100 percent accurate.

Mass screening programs have several distinct drawbacks:

- Screening tests, such as X-rays and stress tests, have inherent dangers.
- The risk of false positive results is high and can create anxiety or acceptance of a disease that does not exist.⁸
- Many tests have a high cost to benefit ratio, especially when the risk of disease is remote and the test results are not totally accurate or reliable.

It can be argued that cost should never be an issue when someone's health is at stake. This argument has strong emotional appeal, especially when that someone is you. But consider this: A person who is feeling fine (asymptomatic) takes a stress test (exercise ECG) in a screening program. The test shows possible heart disease that can only be confirmed by more costly and sometimes dangerous tests like coronary angiography. In this test a radio-opaque dye is injected into the coronary arteries via a catheter to enable an X-ray view of the vessels. A small number of patients die during this procedure. The cost is very high and the effectiveness of treatment, coronary

bypass surgery, is uncertain. If the person truly has heart disease, tests are obviously worthwhile. However, if the screening test has produced a false positive result, needless costs and mental stresses are incurred.

Some promote the use of periodic screening programs with the argument that they can save the agency and the taxpayer money. If one early disability retirement is avoided it can pay for the cost of the program. This is a compelling consideration because an early disability retirement can cost more than a quarter of a million dollars.⁹ Some organizations now use extensive testing programs before employment to minimize future problems. Unfortunately, the fact that false positive results do occur in all sorts of tests makes it likely that some people will be refused employment, or discriminated against, because of a faulty test or a meaningless medical anomaly.

False positive stress tests are more common among active men and women. In a study of world class distance runners, 5 of 20 men had an abnormal ECG during the stress test. This illustrates that a screening program employing the stress test could discriminate against the fit and healthy.

⁸ Absenteeism increased in one industry after a blood pressure screening program.

⁹ Institute of Human Performance, Fairfax, Va

Periodic Medical Examinations

To ward off disease or recover health, men as a rule find it easier to depend on the healers than attempt the more difficult task of living wisely.

— René Dubos

The standard medical examination consists of a thorough medical history¹⁰ and physical exam. It includes measures of height, weight, body fat, blood pressure, and other tests, depending on the patient's age and medical history. For young adults, these usually include a resting electrocardiogram and cholesterol, triglycerides, blood glucose, blood count, and hemoglobin tests. Women are usually checked for iron deficiency, and receive breast examinations and Pap tests. Persons with high heart disease risk and those over 40 are normally given an exercise electrocardiogram (stress test). The cost for a thorough medical exam exceeds \$200.

Certainly the medical exam has a place in a comprehensive employee health program. But our investigations indicate that it should not be the nucleus of such a program. In the last decade, the annual medical examination has received critical scrutiny. In 1969, Dr. William Morgan of the University of West Virginia Medical School called the annual medical exam "the annual fiasco (American style); the investment pays off for the doctor, not for the patient." An article in *Time*, "The Annual Rip-Off" (July 26, 1976), characterized the annual exam as a "myth in American medicine." Dr. John Budd, a past president of the American Medical Society, boasts he has not had a routine physical since he joined the Army in World War II, and asks patients who ask for a check up, "What do you want one for? Who says you need one?"

A trip to the doctor's office does not bring health. If you have no symptoms (asymptomatic) when you go, the trip probably will be a waste of time and money. One way to reduce soaring health care costs is to reduce the frequency of medical exams. Increased spending on medical care in the United States has not significantly improved citizen health. Future improvements in health will rely on changes in lifestyle.

Another reason to consider alternatives to the annual exam is to dispel the myth that the doctor manages your health. Health is each person's responsibility, probably the most important one. Failure to recognize this and act accordingly may be the biggest mistake we can make. One or two hours spent in the doctor's office each year cannot undo bad health habits practiced daily.

It was once thought that the annual exam would reduce the incidence of illness or mortality. But, when those who had annual exams were compared to those who did not, there was an equal number of chronic diseases and deaths (Canadian Med. Assoc. J. 1980).

Almost 50 percent of all visits to doctors are for less serious reasons, such as annual exams or common colds. The medical exam has not been demonstrated to be of value in preserving health, and the cold cures itself.¹¹

Most illnesses are self-limiting. Medical intervention has a significant effect on outcome in only a small percentage of the cases seen by the average physician (Fuchs 1974). But this does not minimize the doctor's role as a health educator who can provide answers to many troublesome questions.

A compromise between those who advocate annual exams and those who say see your physician only when you are concerned about your health is the *periodic* medical examination. The National Conference on Preventive Medicine recommends routine medical exams at age 18, at age 25, and every 5 years until age 65, and every 2 years thereafter as a minimum for adequate preventive health care.

Today the medical examination is being challenged as a standard method of delivering health care. Health maintenance organizations, wellness programs, holistic health, prospective medicine, and medical self-help provide alternatives. Medical experts have begun incorporating proven features from these new methods with medical exams.

As the transition in health care occurs, the annual exam will be done less often. Other health professionals will gradually take on responsibilities for health risk analysis, periodic medical tests, and inoculations. If patients can improve their health habits and self-help skills, the annual check up will become obsolete.

¹⁰ Medical histories are now being computerized. A patient, sitting at a computer terminal, responds to a series of questions designed to elicit a complete medical background.

¹¹ National Ambulatory Care Survey, 1974

Medical examinations should be considered at these times:

- *Before hiring.* This exam, given as needed for special positions, would insure prospective employees are physically capable of performing the job. The exam also would help screen out persons with the types of problems that can lead to early disability retirement, such as back or heart trouble. After a preemployment exam is given, a health risk analysis could follow, using the blood profile from the medical examination.

- *At age 35.* This medical exam should focus on individual health problems. Those with a high coronary heart disease risk should be given an exercise stress test.

- *At age 45.* A medical examination should be given at age 45 and repeated every 5 years.

- *For special cases:* new employees age 35 or older should be tested before employment and every 5 years thereafter. Those with a family history of diabetes, glaucoma, or cancer of the colon should receive specific tests on an annual or every-other-year schedule after 40. Individuals in high-risk positions such as firefighters, police officers, and those in high-pressure positions could be tested more often. Previously sedentary individuals over 35 should consider having a stress test before participating in work or fitness activities that require a major increase in exercise.

Establishing the Health Program

"In health as in safety, prevention is the key."

Type of Program

The first decision in establishing an employee health program is what type of program should the organization have. Our investigation shows that no single program is best, i.e., medical exams, prevention (HRA), or early detection (screening programs). Rather, marriage of the three, as illustrated in figure 1 and table 8, is best. It should provide a comprehensive, cost effective employee health program.

This approach focuses on disease prevention, or "wellness," early in an employee's career when lifestyle changes are easiest to make and the changes do the most good. Medical exams do not enter until later in the employee's career when signs or symptoms a doctor can diagnose are more likely. Screening tests, as appropriate, complement the program throughout the employee's career. Appendix F lists key Federal contacts in setting up a program.

Participation

Participation in a health program must be open to all employees, regardless of age, sex, race, or ethnic origin. Participation cannot be limited to "key people" or by grade. However, priority can be given to employees whose work increases their health risk. This could include those in physically stressful jobs, such as fire and law enforcement, or those in positions of emotional stress.

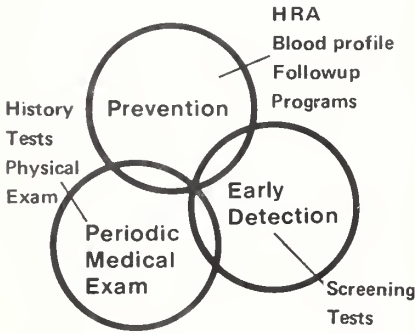


Figure 1. — The components of the employee health program. Some overlap is desirable in a comprehensive, cost-effective health program.

Other Considerations

In line with the policy on occupational health for Federal employees, each department and agency must assess its employee health program in regard to:

- **Extent of program** — Determine the extent to which the department or agency's employees have access to an employee health program and whether health services can be, or have been, made available to employees in remote locations.

- **Services provided** — Determine whether the services are consistent with the minimum standards recommended in HEW publication 77-2033, *An Administrative Guide for Federal Occupational Health Units*.

- **Employee use** — Determine the number of employees who will be able to use the health program. A summary of the services offered, such as emergency treatment, immunizations, early disease detection, medical examinations, referral to private physicians, and other activities related to employee health, should be included.

- **Cost** — Agencies that operate health facilities should keep records on the direct and indirect costs of operating a health service program. This should include personnel compensation and benefits, cost of supplies, utilities, rent and services, and cost, depreciation, and amortization of equipment.

Table 8. — Recommended schedule for testing

Age	Health risk analysis	Medical exam	Disease screening and inoculations
New entry (any age)	X	As required	On an individual or need
Pre-employment)		by job	basis as determined by
30	X		employee medical history,
35		X	job or work environment,
40	X		geographical con-
45		X	siderations, etc.
50		X	
55		X	
60		X	
Every 2 years after 60		X	

When individuals are referred to private physicians for followup, their health insurance covers the cost of diagnostic tests and treatment

According to Federal regulations, an onsite health unit, staffed by registered nurses under the direction of a licensed physician, represents the most effective type of occupational health program and is the type agencies should strive to install.¹² However, an onsite health facility may be impractical due to the dispersion of the work force, and number of employees working in remote locations. In such situations, "alternative methods for providing health services must be considered."¹³

Emergency treatment of illness or injury on the job can be provided by a nearby medical facility or by staff members trained in first aid (particularly at remote or inaccessible worksites).

Other health services can be provided by:

- A Federally operated medical facility
- A privately operated medical facility
- A contract physician
- State and local (city/county) health departments
- Voluntary organizations (such as the Red Cross or Heart Association)

The delivery of health program services to Forest Service Regional offices or research stations or area offices does not present a major problem. But many National Forest and District offices are in small communities or remote sites. Most services can be scheduled at central locations when travel time and cost is not

prohibitive. Another option is to contract with a private company to deliver services at the worksite. A number of companies operate mobile facilities. They offer a variety of services ranging from screening programs to complete examinations, including stress electrocardiograms.

Program coordination can be accomplished by a public health nurse (where numbers permit) or by an interested employee. The safety officer in personnel management would be a likely choice. The program coordinator could manage the various components of an employee health program, including screening programs (blood pressure, hearing, vision), periodic medical exam schedules, inoculation schedules, and health and safety education programs.

Administration support and encouragement can insure participation and success. Complete confidentiality of health and medical records will encourage participation. Health and medical information must be kept separate from personnel files. A physician should screen the test results and contact employees in need of medical followup. After that, the data should be given to the employee in a sealed file.

Followup consists of referral to a private physician, or an individual health prescription such as losing weight, reducing stress, stopping smoking, or beginning exercise. The health program coordinator should maintain contact with the employee who has a health problem until the employee has taken appropriate action to safeguard his or her health.

A filing system should be set up to sort feedback from the physician, program

director, and employees, and to organize forms, check lists, and records of periodic calls. Inexpensive tests of blood pressure, body weight, body fat, and fitness, can be used to follow up and motivate employees.

Sample followup forms are illustrated in *An Administrative Guide for Federal Occupational Health Units*.

Followup procedures are the key to long-lasting changes in health risk. A program coordinator can survey community resources and provide a list of programs for nutrition weight control, stress reduction, smoking, fitness, etc.

Booklets and brochures can help individuals motivate themselves to achieve risk-reducing goals. A health and fitness resource center could provide advice, information, and encouragement. The program coordinator could run the center, maintain the list of resources, and keep employees aware of new opportunities. The coordinator could also insure medical followup and conduct annual followup surveys and program evaluation.

Some agencies provide time on the job to participate in followup programs, such as fitness programs, especially when physical exertion is part of the job. Another approach is time sharing, where the employee promises to train 1 1/2 hours for an equal amount of time on the job. Use of flex-time to extend the length of the lunch hour could provide the opportunity for a fitness program. Provisions for dressing rooms and showers will help some get started. Organized programs can be provided in-house or through community agencies, and low-cost training facilities, such as fitness trails, can be constructed near the work place.

¹² FPM Supplement 792-1.

¹³ *Ibid.*

Evaluating the Health Program

Historically, health programs have been directed toward curing patients rather than preventing illnesses. Until recently preventive maintenance and operating maintenance have been advocated for all types of equipment and facilities, but not for people. Because organizations depend on people to accomplish their goals, progressive organizations are beginning to recognize the importance of health maintenance programs for their employees. Responsible maintenance includes preventive and corrective health measures.

Program objectives should be to:

- Increase the effectiveness of fringe benefit dollars spent on health care by reducing costs or increasing benefits.
- Promote a healthier lifestyle for employees and, when necessary, get employees into self-monitored health improvement programs.
- Improve work attendance through reduction of general illness or recurring ailments.
- Develop a consciousness among managers and personnel of "taking care of themselves" to improve morale and productivity.

Below is an outline of short-term, intermediate, and long-term objectives designed to measure the program's progress, as recommended by R. L. Pyle:

Short-term (3 to 4 months).

Short-term improvements show participants the program is working and worthy of further effort. For example, participants in our Life/Style fitness program were able to see significant changes in HDL after just 3 months of running. Unfortunately, we did not have time, resources, or expertise to develop similar followup for weight control and other lifestyle changes. The primary value of short-term followup is to the individual in terms of:

- Physiological condition improved
- Coronary risk factor evaluated
- Health risk analysis (lifestyle questionnaire) completed

Intermediate (1 year). Intermediate effects tell management if the program is meeting its objective. It also allows evaluation of more subtle changes, such as improvements in self-concepts and work attitudes, and tests the permanence of lifestyle changes instituted at the start of the program. The primary value of the intermediate stage is to the management at the department level in respect to:

- Reduced absenteeism
- Improved group attitude and morale
- Improved self-confidence and self-image of individual
- Prolonged effects of the short-term measures

Long-term (minimum 3 to 5 years). Long-term measures of sufficient duration to affect health costs, indicate the sustained effect of the program: Is the program cost effective? Have health care costs declined? Has productivity increased the desired amount? The primary value of this stage is to management:

- Reduced health care costs
- Increased productivity

With short-term effects of the health program being of primary value to the participants and longer-term effects more important to the organization, the benefits are mutually enjoyed, providing justification and encouragement for management, and employee support and involvement.

Summary

A rational man acting in the real world may be defined as one who decides where he will strike a balance between what he desires and what can be done. It is only in imaginary worlds that we can do whatever we wish.

— Walter Lippmann

An employee program blending prevention (HRA), screening, and medical exams strikes a balance between total reliance on expensive medical examinations and a program that provides a minimum level of health care. This type of program has been shown by others to be effective in promoting good health. It places the major responsibility for good health where it belongs — on the individual.

If a program such as this is adopted, considerable work remains to be done, and minimum medical examination standards and tests should be selected. An employee health program information and education slide-tape should be prepared. Additional materials on smoking cessation, weight-control, diet and nutrition, stress reduction, and fitness programs should be compiled for local reference. Most importantly, a group of key Forest Service people, those likely to become coordinators, should participate in an employee health program seminar. This seminar would be designed to:

- Present the rationale behind the program
- Provide information on key features
- Outline implementation strategies
- Motivate Servicewide adoption

Recommendations

1. Forest Service management review the feasibility of implementing an employee health program that centers on prevention and individual responsibility, but includes early detection and periodic medical exams. Develop a schedule of testing, as suggested in table 8, in consultation with the Public Health Service and the Department of Health and Human Services.

a. Management address the role of preemployment medical exams for all employees.

b. Select one or two Regions for a field trial of the recommended employee health program.

2. Work continue at MEDC to implement the program Servicewide. Give priority to an employee health program seminar. This could be done in FY 1981. Other important tasks include:

- Prepare an employee health program slide-tape and other audiovisual material needed for followup programs.

- Adapt computerized health risk, nutrition-diet, and fitness/weight control programs for use in counseling and followup.

- Pilot test audiovisual and computer programs in Regional trials (1b above).

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Appendix A

Authorization for Employee Health Program

The Federal employee health program as authorized by 5 U.S.C. 7901 states in part, as follows:

"... That, for the purpose of promoting and maintaining the physical and mental fitness of employees of the Federal Government, the heads of Departments and agencies, including Government-owned and controlled corporations are authorized, within the limits of appropriations available to them, to establish by contract or otherwise, health service programs which will provide health services for employees under their respective jurisdictions: Provided that such health service programs shall be established only after consultation with the Public Health Service and consideration of its recommendations, and only in localities where there are a sufficient number of Federal employees to warrant the provision of such services, and shall be limited to (1) treatment of on-the-job illness and dental conditions requiring emergency attention; (2) pre-employment and other examinations; (3) referral of employees to private physicians and dentists; and, (4) preventive programs relating to health. . . ."

Nature, Scope and Content of a Minimum Adequate Employee Health Program (from DHEW Pub. (HSA) 77-2033)

In accordance with 5 U.S.C. 7901, the Public Health Service recommends the following *minimum* program for all employees who are housed in a particular building or adjacent buildings, regardless of the size of the participating population.

- A. Periodic medical examination program
- B. Periodic testing for early detection of chronic diseases or disorders
- C. Immunization programs for influenza and tetanus
- D. Emergency treatment of illness or injury on the job
- E. Referral to private physician or dentist
- F. Health guidance and counseling
- G. Treatments requested by private physician
- H. Emergency ambulance service
- I. Assistance in detecting and solving safety and environmental sanitation problems
- J. Maintain employee health record
- K. Mental and emotional evaluations
- L. Fitness-for-duty examinations
- M. Preemployment examinations

From the Bureau of the Budget, circular A-72:

"The health fitness of Federal employees for efficient performance of their assigned work is an important element in a progressive personnel management system and in effective administration of Federal programs. The head of each department and agency, therefore, will review existing programs and is authorized and encouraged to establish an occupational health program to deal constructively with the health of the employees of his department or agency in relation to their work."

Proposal Evaluation Criteria

Technical proposal will be evaluated on the basis of the following criteria. Relative weights for each criterion are as assigned:

1. *Project understanding — 15%*

The offeror should demonstrate and show recognition of both the scope and objectives of the project to be done.

2. *Soundness of Approach — 30%*

The offeror's program plan should present a realistic approach to accomplish the project. Incorporation of any innovative or unique approaches that improve final product will be recognized.

3. *Development Qualifications — 30%*

The depth and breadth of the offeror's background and experience in knowledge of Health Risk Analysis, its application, interpretation, and ability to apply this knowledge to our package.

4. *Experience in Subject Areas — 15%*

The depth and breadth of the offeror's experience in applying the Health Risk Analysis program will be evaluated based on information known or presented by the offeror.

5. *Production Qualifications — 10%*

Ability of the offeror to bring adequate staff and facilities to bear to provide the materials required within the time allotted will be assessed from information provided by the offeror.

Statement of Work

Division 100 — General Requirements

110 Scope of Contract. It is the intent of the USDA, Forest Service to have an outside company or agency conduct a Health Risk Analysis (HRA) and Blood Chemistry Analysis for 100 employee volunteers. The purpose of these analyses is to pilot test procedures that may be incorporated into a Forest Service Employee Health Program. The following procedures will be completed to accomplish the requirements of the pilot program:

1. Measurements of blood pressure, body weight, and height will be taken.
2. Draw blood from volunteers, process blood samples for shipment, and ship samples to laboratory.
3. Provide and administer Health Risk Analysis questionnaires to volunteers.
4. Conduct a blood screening panel and a high density lipoprotein (HDL) analysis on each blood sample. The blood screen will include the following chemistries:

SGPT
SGOT
LDH
Alkaline Phosphatase
Total Bilirubin
Total Protein
Albumin-Serum
Globin
Cholesterol
Triglycerides
Glucose Fasting
Bun (Urea Nitrogen)
Creatinine
Uric Acid
Calcium
Inorganic Phosphate
Sodium
Potassium
Serum Iron

5. Conduct computerized analysis of Health Risk Profile, (incorporating results of blood chemistry panel and HDL analysis).
6. Provide computer evaluation of the Health Risk Analysis and information to assist in its interpretation.
7. Provide results of blood chemistry panel and HDL analysis and information to assist in its interpretation.
8. Provide a summary of Health Risk Analysis information for the pilot sample population in categories specified under contractor furnished item 124.

120 Contractor-furnished Items

Contractor will furnish:

- 121 Qualified personnel and materials necessary to draw and ship blood samples, take blood pressure, body weight, and height.
- 122 Health Risk Analysis questionnaires, (based on the techniques originally described by Joseph Sadusk, Jack Hall, and Lewis Robbins).
- 123 Computerized evaluation of Health Risk Analysis and blood chemistry panel including HDL, for each employee tested and information to assist in its interpretation.
- 124 Summary of Health Risk Analysis by employment level (management or supervisory and operational or labor), including the following:
 - a. The average life expectancy of employees in comparison to expected levels from national data.
 - b. The average number of years that each employee could add to current life expectancy.
 - c. The ranking of health hazards faced by the employees of the Forest Service.
 - d. The ranking of health and lifestyle conditions that currently impinge on the average life expectancy.
 - e. The average levels of over/underweight, blood pressure, cholesterol, and HDL.

130 *Description and Location.* The administration of Health Risk Analysis questionnaires and collection of blood samples, blood pressure, height, and weight will take place in Missoula, Montana.

140 *Government-Furnished Services and Property.* The Government shall deliver to the Contractor the following listed materials, supplies, property or services (hereinafter referred to as "Government-furnished property") at the places and times specified below. The Contractor shall be liable for all loss or damage of such delivered Government-furnished property until completion and final acceptance of work required under this contract. If the Government fails to make timely delivery of such Government-furnished property suitable for its intended use, and upon written request from the Contractor, the Contracting Officer shall make an equitable adjustment of contract delivery or performance dates or contract price, or both, pursuant to the "Changes" clause of the General Provisions of this contract.

141 The Forest Service will furnish the services (at Missoula, Montana) of a subject specialist to advise and assist the contractor on specific content requirements. The time for such assistance will be mutually agreed upon between the contractor and the Forest Service.

142 The Government will furnish room space at locations in Missoula, Montana, for the contractor to administer questionnaires and collect blood samples.

150 *Pework Conference and Performance Schedule.* Prior to commencement of work, the Contracting Officer will arrange a meeting in Missoula, Montana, with the contractor to discuss the contract terms and work performance requirements. At this time the contractor shall submit his proposal performance schedule showing dates and times he plans to conduct the various requirements of the contract.

The scheduling of questionnaire administration and blood sample collection now referred to as examinations will be subject to the following constraints:

1. All examinations shall be given Monday through Friday between the hours of 7:30 am through 3:30 pm.
2. No examination shall be scheduled on Federally observed holidays.

151 The Notice to Proceed will be issued at the prework conference.

Division 200 — Technical Requirements

210 Program Requirements

211 All information gathered and developed as a result of performing the task described under Division 100 General Requirements must be incorporated into respective individual reports and a summary report for the entire sample population. These reports must be easily understandable by participants and accompanied by interpretive explanations that are understandable to a physician or others qualified in working with Health Risk Analyses.

220 Methodology

221 *Methods.* Any method which readily enables the contractor to meet the desired requirements will be acceptable. Methodology will be mutually agreed upon between the Forest Service and the Contractor.

230 Personnel Qualifications

231 The blood pressure and blood sample collection will be conducted by a qualified professional. Proof of qualifications shall be provided as required by the Contracting Officer.

240 Laboratory Qualifications

241 The blood chemistry panel and HDL analysis will be made by a licensed laboratory medical professional. Proof of qualifications shall be provided as required by the Contracting Officer.

Division 300 — Period of Performance

After receipt of Notice to Proceed, the contractor will have 60 calendar days in which to complete all requirements of the contract.

Division 400 — Acceptance

410 Acceptance will be made when a complete unit, consisting of a questionnaire, blood chemistry panel, HDL analysis, computerized Health Risk Analysis and resultant interpretation for each employee tested, and a Health Risk Analysis summary for tested population is furnished to the Contracting Officer.

Division 500 — Basis of Payment

510 Payment at the contract unit price will be made upon receipt of the Contractor's invoice for each completed and accepted unit as described in clause 410 above.

HEALTH RISK PROFILE

INTERHEALTH

Your answers to the questions that follow will allow us to attempt to give you clues, to some of the greatest risks to your survival over the next 10-year period of your life. By compiling your present risks and estimating your future risks, we may be able to help you begin a series of procedures to reduce these risks.

Please answer every question. All questions, even those that inquire about race or religion, are asked only because they are associated with different risks in certain diseases.

INSTRUCTIONS FOR COMPLETING THESE QUESTIONS PLEASE USE A PENCIL ONLY

- Mark a cross in the box ☒ opposite your answer.
- If you change an answer, please erase the cross completely before marking your corrected answer.
- Be sure to answer every question.

PATIENT IDENTIFICATION

Please print the first two letters of your last name here. 224

Birthdate: 219 Sex: 220 ☐ Male 221 ☐ Female

MONTH DAY YEAR

Weight (Pounds): 222 Height: 223 Feet Inches

OCCUPATION: _____
(such as Housewife, Secretary, Salesperson, Actor, Electrician,
Farmer, Health Services, Miner, Lawyer, Carpenter, etc.)

PRESENT MARITAL STATUS

- | | |
|---------------------------------------|--|
| 231 <input type="checkbox"/> Single | 234 <input type="checkbox"/> Widowed |
| 232 <input type="checkbox"/> Married | 235 <input type="checkbox"/> Separated |
| 233 <input type="checkbox"/> Divorced | 236 <input type="checkbox"/> Remarried |

Has there been a change in marital status in the past year?

- | | |
|---------------------------------|----------------------------------|
| 237 <input type="checkbox"/> No | 238 <input type="checkbox"/> Yes |
|---------------------------------|----------------------------------|

DO YOU LIVE

- | | |
|---|---|
| 239 <input type="checkbox"/> Alone | 241 <input type="checkbox"/> With friends |
| 240 <input type="checkbox"/> With spouse, family or relatives | 242 <input type="checkbox"/> In nursing or boarding home in the last 6 months |
| | 243 <input type="checkbox"/> Other |

LENGTH OF TIME AT PRESENT JOB, OR, IF UNEMPLOYED, AT LAST JOB

- | | |
|---|---|
| 244 <input type="checkbox"/> 1 year or less | 246 <input type="checkbox"/> Over 5 years |
| 245 <input type="checkbox"/> 1-5 years | |

EDUCATION (SCHOOLING)

Mark the one box opposite the last year completed.

- | | | | | | | | | |
|--------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--|--------------------------------|--------------------------------|--------------------------------|
| Grade School | 247 <input type="checkbox"/> 1 | 248 <input type="checkbox"/> 2 | 249 <input type="checkbox"/> 3 | 250 <input type="checkbox"/> 4 | 251 <input type="checkbox"/> 5 | 252 <input type="checkbox"/> 6 | 253 <input type="checkbox"/> 7 | 254 <input type="checkbox"/> 8 |
| High School | 255 <input type="checkbox"/> 1 | 256 <input type="checkbox"/> 2 | 257 <input type="checkbox"/> 3 | 258 <input type="checkbox"/> 4 | | | | |
| Beyond High School | 259 <input type="checkbox"/> 1 | 260 <input type="checkbox"/> 2 | 261 <input type="checkbox"/> 3 | 262 <input type="checkbox"/> 4 | 263 <input type="checkbox"/> 5 or more | | | |

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PLEASE MARK THE ONE ANSWER THAT BEST DESCRIBES HOW MUCH EXERCISE OR PHYSICAL ACTIVITY YOU GET INCLUDING YOUR WORK.

- 009 ☐ Climbing less than five flights of stairs or walking less than ½ mile four times per week, or other equal activity.
010 ☐ Climbing 5-15 flights of stairs or walking ½ - 1½ miles four times per week, or other equal activity.
011 ☐ Climbing 15-20 flights of stairs or walking 1½ - 2 miles four times per week, or other equal activity.
012 ☐ Exercise greater than any of these.

HAVE EITHER OF YOUR NATURAL PARENTS (MOTHER OR FATHER) DIED BEFORE AGE 60 OF HEART TROUBLE?

- 013 ☐ No 014 ☐ Yes

IF YES, MARK THE ONE CORRECT ANSWER:

- 015 ☐ One parent died before age 60 of heart trouble.
016 ☐ Both parents died before age 60 of heart trouble.

HAVE YOU EVER BEEN TOLD THAT YOU HAD DIABETES (*TOO MUCH SUGAR IN THE BLOOD*)?

- 017 ☐ No 018 ☐ Yes

IF YES, MARK ALL CORRECT ANSWERS:

- 019 ☐ I follow a diet for diabetes.
020 ☐ I take insulin (shots) for diabetes.
021 ☐ I take pills for diabetes.
022 ☐ None of these.

HAVE YOUR NATURAL PARENTS (MOTHER OR FATHER), BROTHERS OR SISTERS HAD DIABETES?

- 023 ☐ No 024 ☐ Yes

HAVE YOU EVER HAD CHEST X-RAYS?

- 025 ☐ No 026 ☐ Yes

IF YES, MARK ALL CORRECT ANSWERS ABOUT THE X-RAYS:

- 027 ☐ They were not normal.
028 ☐ I don't know the result.
029 ☐ Some were normal, some were not normal.
030 ☐ The X-ray was normal within the past 12 months.
225 ☐ None of these.

MARK YOUR RACE

- 215 ☐ Black 216 ☐ Red 217 ☐ White 218 ☐ Yellow 228 ☐ Other _____

DO YOU HAVE SICKLE CELL ANEMIA?

- 229 ☐ No 230 ☐ Yes

HAVE YOU EVER HAD AN ECG (*EKG, ELECTROCARDIOGRAM, HEART TRACING*)?

- 031 ☐ No 032 ☐ Yes

IF YES, MARK ALL CORRECT ANSWERS:

- 033 ☐ It was not normal within 3 years.
034 ☐ Some were normal, some were not normal.
035 ☐ They were all normal.
036 ☐ I don't know the result.
037 ☐ None of these.

HAVE YOU EVER BEEN TOLD YOU HAD TROUBLE WITH YOUR HEART?

- 264 ☐ No 265 ☐ Yes

IF YES, MARK ALL ANSWERS THAT SEEM LIKE WHAT WAS SAID ABOUT YOUR HEART:

- 266 ☐ It was a heart murmur or a leaky heart. 268 ☐ It was angina or angina pectoris.
267 ☐ It was rheumatic fever. 269 ☐ It was a heart attack or coronary.

DO YOU TAKE PENICILLIN OR MEDICINE LIKE IT TO PREVENT HEART INFECTION OR RHEUMATIC FEVER?

- 007 ☐ No 008 ☐ Yes

HAVE YOU EVER BEEN TOLD YOU HAD HIGH BLOOD PRESSURE?

- 270 ☐ No 271 ☐ Yes

IF YES, WHAT WAS YOUR HIGHEST BLOOD PRESSURE? 272 _____

HAVE YOU TAKEN ANY MEDICINE FOR YOUR HEART OR BLOOD PRESSURE DURING THE PAST 6 MONTHS?

- 273 ☐ No 274 ☐ Yes

DO YOU NOW SMOKE?

038 ☐ No 039 ☐ Yes

IF YES, MARK ALL CORRECT ANSWERS:

I smoke.

- 040 ☐ Cigarettes - 2 or more packs per day.
041 ☐ Cigarettes - 1½ packs per day.
042 ☐ Cigarettes - 1 pack per day.
043 ☐ Cigarettes - ½ pack per day.
044 ☐ Cigarettes - less than ½ pack per day.
045 ☐ Cigars or pipe - 5 or more per day (combined total).
046 ☐ Cigars or pipe - less than 5 per day (combined total).

DID YOU SMOKE, BUT NO LONGER DO?

047 ☐ No 048 ☐ Yes

IF YES,

How long ago did you stop? 049 _____ years ago
If less than one year — 050 _____ months ago

IF YOU DID SMOKE, MARK ALL CORRECT ANSWERS:

I smoked:

- 051 ☐ Cigarettes - 2 or more packs per day.
052 ☐ Cigarettes - 1½ packs per day.
053 ☐ Cigarettes - 1 pack per day.
054 ☐ Cigarettes - ½ pack per day.
055 ☐ Cigarettes - less than ½ pack per day.
056 ☐ Cigars or pipe - 5 or more per day (combined total).
057 ☐ Cigars or pipe - less than 5 per day (combined total).

HAVE YOU EVER BEEN TOLD YOU HAD LUNG TROUBLE OR BREATHING TROUBLE?

058 ☐ No 059 ☐ Yes

IF YES, MARK ALL CORRECT ANSWERS:

- 060 ☐ The trouble was emphysema.
061 ☐ The trouble was pneumonia.
062 ☐ I had tuberculosis (TB, consumption).
063 ☐ I am being treated for tuberculosis now.
064 ☐ None of these.

HAVE YOU HAD A SKIN TEST FOR TB (TUBERCULOSIS, CONSUMPTION) IN THE PAST YEAR?

065 ☐ No 066 ☐ Yes

IF YES, MARK ALL CORRECT ANSWERS:

- 067 ☐ It was negative or normal.
068 ☐ It became positive or not normal this year.
069 ☐ It was positive this year and also before that.
070 ☐ None of these.

IN THE PAST SIX (6) MONTHS HAVE YOU HAD BLEEDING FROM YOUR RECTUM (WHERE YOUR BOWEL MOVEMENTS COME OUT)?

071 ☐ No 072 ☐ Yes

HAVE YOU HAD A FINGER EXAMINATION OF YOUR RECTUM (WHERE YOUR BOWEL MOVEMENTS COME OUT) BY YOUR DOCTOR IN THE PAST YEAR?

073 ☐ No 074 ☐ Yes

HAVE YOU HAD AN EXAMINATION OF YOUR RECTUM OR COLON BY YOUR DOCTOR WITH A LIGHTED INSTRUMENT IN THE PAST YEAR (SIGMOIDOSCOPY, PROCTO, PROCTOSCOPY)?

075 ☐ No 076 ☐ Yes

HAVE YOU EVER HAD POLYPS (SMALL TUMORS) OR GROWTHS IN YOUR INTESTINE OR RECTUM (NOT PILES OR HEMORRHOIDS)?

077 ☐ No 078 ☐ Yes

DO YOU HAVE ULCERATIVE COLITIS (BLOODY DIARRHEA WITH PUS AND MUCOUS AND SORES INSIDE THE RECTUM)?

079 ☐ No 080 ☐ Yes

IF YES, MARK HOW LONG YOU HAVE HAD IT:

- 081 ☐ More than 10 years
082 ☐ 10 years or less

HOW MANY TOTAL MILES PER YEAR DO YOU TRAVEL IN A CAR OR MOTOR VEHICLE AS A DRIVER OR PASSENGER?

083 _____ miles per year.

To help you in estimating the number of miles you drive or ride, the national averages for the following categories of driving are listed below:

Driving to and from work — 8000 miles per year.

Driving to and from shopping and other personal business — 4000 miles per year.

Driving to and from school and church — 1000 miles per year.

Driving to and from pleasure, recreation and miscellaneous — 5000 miles per year.

HOW MANY OF THESE MILES ARE ON A FREEWAY, EXPRESSWAY, TOLL ROAD OR OTHER SIMILAR LIMITED ACCESS HIGHWAY?

084 ☐ Most (75% or more) 085 ☐ Some (25-74%) 086 ☐ Little (0-24%)

WHEN IN A MOTOR VEHICLE (CAR), DO YOU WEAR A SEAT BELT OR SHOULDER HARNESS?

087 ☐ No 088 ☐ Yes

IF YES, MARK WHEN YOU WEAR IT:

089 ☐ Less than 10% of the time.

090 ☐ 10 - 24% of the time.

091 ☐ 25 - 74% of the time.

092 ☐ 75% or more of the time.

MARK ANY OF THESE THAT YOU DO:

093 ☐ Fly a private plane

094 ☐ Sky dive

095 ☐ Skin dive - scuba dive

096 ☐ Drive a racing car, dune buggy, snowmobile, or motorcycle in dirt (off the road)

227 ☐ Drive a motorcycle on the street

MARK ANY OF THE MEDICINES YOU ARE NOW TAKING

097 ☐ Mood elevators (pills of depression)

098 ☐ Pep or diet pills (like dexadrine)

099 ☐ Tranquilizers, sedatives, nerve or sleeping pills (Miltown, Librium, Phenobarbital, Nembutal, Seconal, etc.)

100 ☐ Pain pills (Demerol, codeine, morphine, etc.)

101 ☐ Antihistamines or allergy pills

DO YOU NOW DRINK ANY ALCOHOLIC BEVERAGES (BEER, WINE, WHISKEY, GIN, VODKA, ETC)?

102 ☐ No 103 ☐ Yes

IF YES, MARK THE ONE CORRECT ANSWER:

I drink:

104 ☐ 2 or less drinks per week.

105 ☐ 3 to 6 drinks per week.

282 ☐ 7 to 14 drinks per week.

275 ☐ 15 to 24 drinks per week.

107 ☐ 25 to 40 drinks per week.

108 ☐ More than 40 drinks per week.

DID YOU FORMERLY DRINK ANY ALCOHOLIC BEVERAGES (BEER, WINE, WHISKEY, GIN, VODKA, ETC.) AND NO LONGER DO?

109 ☐ No 110 ☐ Yes

IF YES, MARK THE ONE CORRECT ANSWER:

I drank:

111 ☐ 2 or less drinks per week.

112 ☐ 3 to 6 drinks per week.

283 ☐ 7 to 14 drinks per week.

276 ☐ 15 to 24 drinks per week.

114 ☐ 25 to 40 drinks per week.

115 ☐ More than 40 drinks per week.

HAVE YOU EVER BEEN TOLD YOU HAD LIVER DISEASE DUE TO DRINKING?

277 ☐ No 278 ☐ Yes

HAS ANYONE IN YOUR IMMEDIATE FAMILY (PARENTS, BROTHERS, SISTERS) TAKEN HIS OR HER OWN LIFE (COMMITTED SUICIDE)?

116 ☐ No 117 ☐ Yes

DO YOU NOW HAVE OR HAVE YOU HAD FEELINGS THAT LIFE IS NOT WORTH LIVING?

118 ☐ No 119 ☐ Yes

DOES EACH DAY LOOK SO DULL THAT YOU WOULD RATHER NOT WAKE UP IN THE MORNING?

120 ☐ No 121 ☐ Yes

DO YOU WORRY OR FEEL BLUE MUCH OF THE TIME?

122 ☐ No 123 ☐ Yes

DO YOU EVER FEEL LIKE SWEARING?

124 ☐ No 125 ☐ Yes

DO YOU HAVE TROUBLE WITH WAKING UP TOO EARLY OR BEING UNABLE TO STAY ASLEEP?

126 ☐ No 127 ☐ Yes

IF YOU HAD YOUR LIFE TO LIVE OVER AGAIN, WOULD YOU DO MOST EVERYTHING SOME OTHER WAY?

128 ☐ No 129 ☐ Yes

CONCERNING THE FUTURE, DO YOU FEEL SURE, POSITIVE, AND HOPEFUL?

284 ☐ No 285 ☐ Yes

IF YOU WERE SURE YOU COULD GET AWAY WITH IT, WOULD YOU GO INTO A BALL GAME OR THEATER WITHOUT PAYING?

132 ☐ No 133 ☐ Yes

DO YOU FEEL WORTHLESS AND THAT OTHERS WOULD BE BETTER OFF IF YOU WERE DEAD?

134 ☐ No 135 ☐ Yes

DO YOU LIKE EVERYONE YOU KNOW?

136 ☐ No 137 ☐ Yes

HAVE YOU EVER SERIOUSLY CONSIDERED KILLING YOURSELF?

138 ☐ No 139 ☐ Yes

DO YOU GET ANGRY SOMETIMES?

140 ☐ No 141 ☐ Yes

DO YOU OFTEN FEEL ALONE AND LONELY EVEN WHEN THERE ARE OTHERS AROUND YOU?

142 ☐ No 143 ☐ Yes

HAVE YOU LOST YOUR APPETITE OR HAVE YOU HAD VERY MUCH LESS DESIRE TO EAT?

144 ☐ No 145 ☐ Yes

DO YOU SOMETIMES HAVE THOUGHTS TOO BAD TO TELL OTHERS?

146 ☐ No 147 ☐ Yes

DO YOU ENJOY A LITTLE FLIRTING?

148 ☐ No 149 ☐ Yes

DO YOU FEEL DEPRESSED OFTEN (MORE THAN 50% OF THE TIME)?

150 ☐ No 151 ☐ Yes

DO YOU CARRY A GUN OR KNIFE OTHER THAN A POCKET KNIFE? (THIS INCLUDES CARRYING A WEAPON IN YOUR WORK.)

152 ☐ No 153 ☐ Yes

HAVE YOU EVER BEEN ARRESTED FOR A SERIOUS CRIME LIKE ROBBERY OR ATTACKING SOMEONE?

154 ☐ No 155 ☐ Yes

DO YOU THINK HOW YOU LIVE (YOUR ECONOMIC AND SOCIAL STATUS) IS:

156 ☐ Low 157 ☐ Medium 158 ☐ High

HAVE YOU EVER HAD CANCER OR A MALIGNANT TUMOR?

159 ☐ No 160 ☐ Yes

IF YES, MARK WHERE THE CANCER OR MALIGNANT TUMOR WAS LOCATED:

161 ☐ Throat
162 ☐ Colon-Intestines (large bowel)
163 ☐ Breast
164 ☐ Brain or Nervous System
165 ☐ Lung
166 ☐ Rectum
279 ☐ Other (Explain) _____

167 ☐ Stomach
168 ☐ Hodgkins Disease or Lymphosarcoma
170 ☐ Leukemia
172 ☐ Prostate
173 ☐ Esophagus (swallowing tube)
171 ☐ Ovaries

FOR WOMEN ONLY

HAS YOUR MOTHER OR SISTER HAD BREAST CANCER?

174 ☐ No 175 ☐ Yes

DO YOU EXAMINE YOUR BREASTS EACH MONTH TO DETECT CANCER?

176 ☐ No 177 ☐ Yes

DO YOU GO TO THE DOCTOR FOR A BREAST EXAMINATION AT LEAST ONCE EACH YEAR?

178 ☐ No 179 ☐ Yes

DO YOU HAVE X-RAYS OF YOUR BREASTS (NOT CHEST X RAYS) FOR CANCER AT LEAST ONCE A YEAR?

180 ☐ No 181 ☐ Yes

HAS YOUR UTERUS (WOMB) BEEN REMOVED?

182 ☐ No 183 ☐ Yes

IF YES, WAS IT REMOVED FOR CANCER?

184 ☐ No 185 ☐ Yes

HAS YOUR CERVIX (NECK OF WOMB) BEEN REMOVED?

186 ☐ No 187 ☐ Yes

IF YES, WAS IT REMOVED FOR CANCER?

188 ☐ No 189 ☐ Yes

HAVE BOTH YOUR OVARIES (SEX GLANDS) BEEN REMOVED?

190 ☐ No 191 ☐ Yes

IF YES, MARK AGE REMOVED

Age removed: 192 _____ years.

DO YOU HAVE VAGINAL BLEEDING (BLEEDING FROM YOUR FEMALES, BIRTH CANAL)?

193 ☐ No 194 ☐ Yes

IF YES, MARK ALL CORRECT ANSWERS ABOUT WHEN THE BLEEDING HAPPENS:

- 195 ☐ Between menstrual periods.
196 ☐ During or after sexual intercourse.
197 ☐ My periods have stopped, but I still have bleeding once in a while.
198 ☐ I am taking female hormones (estrogens) and I only bleed when I am off these hormones.
199 ☐ I am taking female hormones (estrogens) but I bleed whether I am taking them or not.
226 ☐ Only with my menstrual periods.

HAVE YOU EVER HAD SEXUAL INTERCOURSE?

200 ☐ No 201 ☐ Yes

IF YES, MARK WHEN IT BEGAN:

- 202 ☐ Before 20 years old
203 ☐ Between 20 and 25 years old
204 ☐ After 25 years old

DO YOU NOW TAKE BIRTH CONTROL PILLS?

280 ☐ No 281 ☐ Yes

ARE YOU JEWISH? (CANCER OF THE CERVIX IS VERY RARE IN JEWISH WOMEN)

205 ☐ No 206 ☐ Yes

HAVE YOU EVER HAD A PAP (CANCER) SMEAR?

207 ☐ No 208 ☐ Yes

IF YES, MARK ALL CORRECT ANSWERS:

- 209 ☐ Some were not normal in the past 5 years.
210 ☐ Three or more were normal in the last 5 years.
211 ☐ One was normal within the last 12 months (none not normal).
212 ☐ One was normal within the last 5 years (none not normal).
213 ☐ I don't know the results.
214 ☐ I have not had a pap smear in 5 years.

Complete as much of the following information as possible. The more information we have, the more meaningful the report will be. Fill out the name only if you want the name to appear on the report. If the name is not completed, only the first two letters of the last name will print. Your doctor may be able to provide you with some of this information.

NAME _____
 (OPTIONAL) (LAST) (FIRST)

*BLOOD PRESSURE
 CURRENT SYS DIA HIGHEST (if available) SYS DIA

*CHOLESTEROL
 CURRENT _____ MG% HIGHEST (if available) _____ MG%

*TRIGLYCERIDES _____ MG% HIGHEST (if available) _____ MG%

GLUCOSE 1 HOUR (if available) _____ MG% GLUCOSE FASTING (if available) _____ MG%

KNOWN DIABETIC NO ☐ YES ☐

CONTROLLED DIABETIC NO ☐ YES ☐

ABNORMAL ELECTROCARDIOGRAM (ECG)
 WITHIN LAST THREE YEARS NO ☐ YES ☐

FORCED EXPIRATORY VOLUME (1 SECOND)
 LESS THAN 60% OF NORMAL NO ☐ YES ☐

HISTORY OF HEART ATTACK OR
 CORONARY OR ANGINA NO ☐ YES ☐

HISTORY OF STROKE NO ☐ YES ☐

ABNORMAL SGOT OR SGPT (LIVER TESTS) NO ☐ YES ☐

*This information is of special significance and should be supplied whenever possible. If not, average values will be used.

JONES, MARY

HEALTH RISK PROFILE

122277

STAYWELL PROGRAM

DATE 12-22-77 ID 000018108 F

CURR B.P. 144/98 PREV B.P. NOT GIVEN CURR CHOL. 200 MG % PREV CHOL. NOT GIVEN
 HT. 67 IN. WT. 166 LBS. CURR TRIG. 231 MG % PREV TRIG. NOT GIVEN

AVERAGE TEN YEAR RISK OF DEATH PER 100,000 6,489 YOUR PRESENT AGE 51
 YOUR CURRENT TEN YEAR RISK OF DEATH PER 100,000 8,893 YOUR CURRENT RISK AGE 55
 YOUR ACHIEVABLE TEN YEAR RISK OF DEATH PER 100,000 4,994 YOUR ACHIEVABLE AGE 48

AN AVG. WOMAN YOUR AGE HAS 6,489 CHANCES OF DYING PER 100,000 IN THE NEXT 10 YRS.
 YOUR RISKS ARE 37% GREATER THAN THE AVERAGE.
 YOU COULD REDUCE YOUR RISKS BY 43 %.

NOTE SOME DATA SUGGESTS THE FOLLOWING DISEASES WHICH MAY SIGNIFICANTLY
 INCREASE RISK.

TUBERCULOSIS

NOTE THIS PROFILE DOES NOT INCLUDE ANY RISK FOR THE FOLLOWING DISEASE(S)
 DUE TO THE REMOVAL OF THE ORGAN FOR NON-CANCEROUS REASONS

CANCER OF CERVIX

CANCER OF UTERUS

FACTORS THAT MAY OFFER THE
 GREATEST REDUCTION IN RISK

COMBINED ACHIEVABLE BENEFIT
 WITH CHANGE OF THESE FACTORS

NOT SMOKING..... 2.7 YRS
 NOT DRINKING..... 1.1 YRS
 EXERCISE PROGRAM..... .9 YRS
 WEIGHT REDUCTION..... .4 YRS
 BLOOD PRESSURE REDUCTION..... .3 YRS
 CHOLESTEROL REDUCTION..... .1 YRS
 OTHER..... 1.5 YRS
 TOTAL REDUCTION IN RISK..... 7.0 YRS

YOUR RISKS IN DESCENDING IMPORTANCE. #1 IS HIGHEST.

A RISK FACTOR OF 1.0 IS AVERAGE. A RISK FACTOR LESS THAN 1.0 CARRIES LESS THAN
 AVERAGE RISK. A RISK FACTOR ABOVE 1.0 CARRIES GREATER THAN AVERAGE RISK.

4.1 ARTERIOSCLEROTIC HEART DISEASE (HEART ATTACK)

AVERAGE RISK 1,260 *****

YOUR CURRENT RISK 3,276 *****

(2.6 X AVG)

YOUR ACHIEVABLE RISK 743 *****

(.6 X AVG)

CONTRIBUTING FACTORS	RISK FACTOR	RISK REDUCING FACTORS	RISK FACTOR
B.P. (CURR) ---144/98	.8	B.P. 120/80 OR LESS	.6
CHOL (CURR) ---200MG+	.7	CHOLESTEROL 180 OR LESS	.6
DIABETES-NO	1.0		1.0
EXERCISE-SEDENTARY	1.4	SUPERVISED EXERCISE	1.0
FM /ASHD NO EARLY DEATH	.9		.9
SMOKER---1 PACK/DAY	1.9	NOT SMOKING	.9
WEIGHT-166 LBS.	1.2	WEIGHT-134 LBS. OR LESS	1.0
NO HX. OF ABNORMAL ECG	1.0		1.0
TRIG.---(CUR)---231MG%	1.6	TRIGLYCERIDES < 151 MG%	1.3

EXCESSIVE STRESS MAY INCREASE RISK. EXACT RISK FACTOR NOT YET AVAILABLE.

JONES, MARY

HEALTH RISK PROFILE

(CONTINUED) 122277

STAYWELL PROGRAM

DATE 12-22-77 ID 000018108 F

2 LUNG CANCER

AVERAGE RISK	386 *****	
YOUR CURRENT RISK	772 *****	(2.0 X AVG)
YOUR ACHIEVABLE RISK	618 *****	(1.6 X AVG)

CONTRIBUTING FACTORS	RISK FACTOR	RISK REDUCING FACTORS	RISK FACTOR
SMOKER--1 PACK/DAY	2.0	NOT SMOKING	1.6
		REMAIN STOPPED 5 YEARS	.6

2 CIRRHOSIS OF LIVER

AVERAGE RISK	284 *****	
YOUR CURRENT RISK	710 *****	(2.5 X AVG)
YOUR ACHIEVABLE RISK	57 **	(.2 X AVG)

CONTRIBUTING FACTORS	RISK FACTOR	RISK REDUCING FACTORS	RISK FACTOR
ALCOHOL--25-40 DRINKS/WK	2.5	NOT DRINKING	.2
LIVER FUNCTION	1.0		1.0

4 BREAST CANCER

AVERAGE RISK	684 *****	
YOUR CURRENT RISK	479 *****	(.7 X AVG)
YOUR ACHIEVABLE RISK	342 *****	(.5 X AVG)

CONTRIBUTING FACTORS	RISK FACTOR	RISK REDUCING FACTORS	RISK FACTOR
CURRENT FACTOR	.7	ACHIEVABLE FACTOR	.5
FAMILY HISTORY--NO			
MONTHLY SELF-EXAM--YES			
YEARLY MD EXAM--YES			
YEARLY MAMMOGRAPHY--NO		YEARLY MAMMOGRAPHY	

5 STROKE

AVERAGE RISK	422 *****	
YOUR CURRENT RISK	405 *****	(1.0 X AVG)
YOUR ACHIEVABLE RISK	177 ****	(.4 X AVG)

CONTRIBUTING FACTORS	RISK FACTOR	RISK REDUCING FACTORS	RISK FACTOR
F.P. (CURR) ---144/90	.8	B.P. 120/80 OR LESS	.6
CHL (CURR) --- 200MG	.7		.7
DIABETES--NO	1.0		1.0
SMOKER--1 PACK/DAY	1.4	NOT SMOKING	1.0
NO HX. OF ABNORMAL ECG	1.0		1.0

6 CANCER OF INTESTINES AND RECTUM

AVERAGE RISK	277 *****	
YOUR CURRENT RISK	277 *****	(AVERAGE)
YOUR ACHIEVABLE RISK	82 ***	(.3 X AVG)

CONTRIBUTING FACTORS	RISK FACTOR	RISK REDUCING FACTORS	RISK FACTOR
INTESTINAL POLYP--NO	1.0		1.0
RECTAL BLEEDING--NO	1.0		1.0
ULC. COLITIS--NO	1.0		1.0
ANNUAL SIGMOID--NO	1.0	ANNUAL IN FUTURE	.3

JONES, MARY

HEALTH RISK PROFILE

(CONTINUED) 122277

STAYWELL PROGRAM

DATE 12-22-77 ID 000018108 F

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# 7 CANCER OF OVARIES                NO FACTORS FOR THIS CAUSE OF DEATH
AVERAGE RISK                227 *****
YOUR CURRENT RISK            227 ***** ( AVERAGE )
YOUR ACHIEVABLE RISK        227 ***** ( AVERAGE )
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# 8 SUICIDE
AVERAGE RISK                131 *****
YOUR CURRENT RISK            131 ***** ( AVERAGE )
YOUR ACHIEVABLE RISK        131 ***** ( AVERAGE )
-----

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CONTRIBUTING FACTORS	RISK FACTOR	RISK REDUCING FACTORS	RISK FACTOR
NO DEPRESSION	1.0		1.0
PM SUICIDE=NO	1.0		1.0
ALCOHOL=25-40 DRINKS/WK	1.0		1.0

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-----
# 9 CHRONIC RHEUMATIC HEART DISEASE
AVERAGE RISK                111 *****
YOUR CURRENT RISK            11 * ( .1 X AVG)
YOUR ACHIEVABLE RISK        11 * ( .1 X AVG)
-----

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CONTRIBUTING FACTORS	RISK FACTOR	RISK REDUCING FACTORS	RISK FACTOR
NO FX. RHEUMATIC FEVER			
NO FX. HEART MURMUR	.1		.1

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#10 CANCER OF CERVIX
AVERAGE RISK                103 *****
YOUR CURRENT RISK            0 ( .0 X AVG)
YOUR ACHIEVABLE RISK        0 ( .0 X AVG)
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CONTRIBUTING FACTORS	RISK FACTOR	RISK REDUCING FACTORS	RISK FACTOR
**** ORGAN REMOVED	.0		.0

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-----
OTHER: ALL OTHER CAUSES OF DEATH (APPROX 1000) WHOSE TOTAL RISK IS 2,604
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THIS APPRAISAL IS BASED ON POSSIBLE 10 YEAR RISK USING DATA BELIEVED TO BE VALID. PRE-EXISTING DISEASE MAY TOTALLY INVALIDATE THE RESULT. THE RISK REDUCING MEASURES HOWEVER ARE ONLY GUIDELINES FOR THE INDIVIDUAL AND SHOULD BE UNDERTAKEN ONLY WITH THE SUPERVISION OF A PHYSICIAN. THE 1974 GELLER TABLES ARE UTILIZED IN THE COMPUTATIONS. RISK FACTORS ARE CONSTANTLY APPRAISED AND UPDATED AS DATA WARRANTS.

NAME JONES, MARY

I.D. 00C018108

HOW TO UNDERSTAND YOUR LABORATORY RESULTS.

THE LABORATORY RESULTS SCAN A NUMBER OF DIFFERENT BLOOD AREAS. ABNORMALITIES DO NOT NECESSARILY MEAN DISEASE AND SOME PEOPLE WITH DISEASE MAY HAVE NORMAL TESTS. THE TESTS, MAY HOWEVER, GIVE CLUES TO BE FOLLOWED. IN GENERAL, NON-ASTERISKED RESULTS INDICATE NORMAL VALUES, WHILE SINGLE ASTERISKS INDICATE MINIMAL VARIATION FROM THE NORM, AND TWO ASTERISKS INDICATE SIGNIFICANT VARIATION FROM THE NORM. MINOR VARIATIONS FROM THESE AVERAGE RANGES CAN BE SEEN IN NORMAL PEOPLE AND ARE NOT CAUSE FOR ALARM BUT FOR FURTHER RECHECK. SINGLE DETERMINATIONS OF ANY TEST FREQUENTLY REQUIRE CONFIRMATION.

SGPT-SGOT: MATERIALS FOUND INSIDE OF LIVER CELLS AND MUSCLE CELLS. DAMAGE TO THESE MAY INCREASE VALUES.

LEH: A MATERIAL FOUND IN BLOOD CELLS AND LIVER CELLS. BREAK DOWN OF BLOOD CELLS OR LIVER DAMAGE MAY INCREASE VALUES.

ALK. PHOS. (ALKALINE PHOSPHATASE): A MATERIAL IN THE BLOOD RELATED TO LIVER OR BONE. YOUNG PEOPLE MAY HAVE HIGHER VALUES.

TOTAL BILI. (BILIRUBIN): LEVEL OF BILE PIGMENT IN THE BLOOD. INCREASES CAN BE ASSOCIATED WITH LIVER DISEASE OR BREAKDOWN OF THE RED BLOOD CELLS. SLIGHT INCREASES SOMETIME SEEN WITHOUT SIGNIFICANCE.

TOTAL PROTEIN: IS THE COMBINATION OF ALBUMIN AND GLOBULIN, ANOTHER BLOOD PROTEIN. ABNORMAL VALUES OCCUR IN LIVER DISEASE AND WITH POOR DIET.

ALBUMIN-SERUM (ALBUMIN): A BLOOD PROTEIN MANUFACTURED BY THE LIVER. MARKED CHANGES MAY BE RELATED TO LIVER DISEASE OR POOR NUTRITION.

GLOBULIN: SIMILAR TO ALBUMIN BUT CONTAINS SOME PORTIONS OF THE BLOOD RELATED TO IMMUNITY. MINOR VARIATIONS ARE COMMON.

CHOLESTEROL: A BLOOD FAT IN PART RELATED TO EATING OF ANIMAL FATS SUCH AS EGGS, CHEESE, CREAM, LIVER, PORK, BEEF FAT, ETC. INCREASED VALUES MAY INDICATE A TENDENCY TO HARDENING OF THE ARTERIES. VALUES OF 180 OR LESS ARE ASSOCIATED WITH THE LEAST RISK OF HEART ATTACK.

TRIGLYCERIDES: ARE BLOOD FATS RELATED MORE TO TOTAL CALORIES AND STARCH, ESPECIALLY SWEETS, IN DIET RATHER THAN TO FAT. HIGH LEVELS CAN LEAD TO HARDENING OF THE ARTERIES. ALCOHOL WILL ALSO INCREASE VALUES.

GLUCOSE-FASTING: BLOOD SUGAR TEST. HIGH VALUES SEEN IN DIABETES, MAY BE ALTERED BY DIET AND MEDICATION.

BUN (UREA NITROGEN): MEASURES SIMILAR THINGS TO CREATININE.

CREATININE: A WASTE PRODUCT WHICH SHOULD BE REMOVED FROM THE BLOOD BY THE KIDNEYS.

URIC ACID: IS A MATERIAL EXCESSIVE AMOUNTS OF WHICH CAN DEPOSIT IN THE KIDNEY AND CAUSE STONES OR IN THE JOINTS AND CAUSE GOUT. SOME WATER PILLS MAY INCREASE THE VALUE.

CALCIUM: A MINERAL IN THE BLOOD COMING FROM THE BONE. ABNORMALITIES OF THE BONE SUCH AS LOSS OF BONE TISSUE CAN INCREASE VALUES WHILE POOR INTAKE, KIDNEY DISEASE, AND LACK OF VITAMIN D CAN DECREASE THE VALUE.

INORGANIC PHOSPHATE: GENERALLY RELATED TO BONE ACTIVITY AND USUALLY FOLLOWS EXACT OPPOSITE PATTERN TO BLOOD CALCIUM.

SODIUM: A BODY SALT. KIDNEY DISEASE AND CERTAIN DISEASES OF THE ADRENAL GLAND AND DEHYDRATION CAN CAUSE ABNORMAL VALUES.

POTASSIUM: ONE OF THE BODY SALTS. FOUND MOSTLY INSIDE OF BODY CELLS. LONG FASTING AND THE BREAK DOWN OF BLOOD CELLS IN HANDLING CAN INCREASE THE VALUE. WATER PILLS WILL FREQUENTLY LOWER THE VALUE, KIDNEY DAMAGE INCREASES IT.

SERUM IRON: MEASURES IRON STORES. IT MAY BE LOW IN ANEMIA AND HIGH WITH EXCESSIVE IRON AND PREGNANCY. MORNING VALUES MAY BE MUCH HIGHER THAN AFTERNOON VALUES.

INTERHEALTH
2970 FIFTH AVE.
SAN DIEGO, CA. 92103
DATE 12 22 77

122277

LABORATORY RESULTS

STAYWELL PROGRAM

NAME JONES, MARY

I.D. C00018108

DATE 12/77

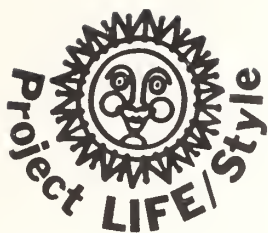
AVERAGE RANGE

BLOOD CHEMISTRIES

SGPT	15	< 41 MU./ML
SGOT	25	< 56 MU./ML
LDH	157	90 - 225 MU./ML
ALK. PHOS.	70	35-120 MU./ML
TOTAL BILI.	4.0 **	.1 - 1.2 MG %
TOTAL PROTEIN	6.8	6 - 8.5 GM %
ALBUMIN-SERUM	3.9	3.7 - 5.5 GM
GLOBULIN	2.9	1.8 - 3.5 GM
CHOLESTEROL	200	UP TO 330 MGM %
TRIGLYCERIDES	231 **	UP TO 175 MG %
GLUCOSE FASTING	95	70-125 MG %
BUN	23	6 - 26
CREATININE	.9	< 1.4 MG %
URIC ACID	5.1	< 7.7 MG %
CALCIUM	9.0	8.5-11.0 MG %
INORGANIC PHOSPHATE	3.6	2.4 - 4.7 MG
SODIUM	139	136-145 MEQ/L
POTASSIUM	4.6	3.5-5.0 MEQ/L
SERUM IRON	71	40 - 175 MCG/DL

LABORATORY DIRECTOR: J.R. ABRAHAMSON M.D.: M/CM = M/CU.M.M. /CM = /CU.M.M.

6 MONTHS FOLLOW-UP



Six months ago you completed a Health Risk Analysis and Blood Profile. We are interested in your reactions to the procedures and in any progress you have made toward a healthier lifestyle.

your name	date	telephone
-----------	------	-----------

Project Life/Style (check only the items in which you participated)

- Health Risk Analysis ☐ very useful ☐ useful ☐ not useful Blood Profile ☐ very useful ☐ useful ☐ not useful
- Group Session ☐ very useful ☐ useful ☐ not useful Individual Session ☐ very useful ☐ useful ☐ not useful
- Program Materials (booklets, pamphlets) ☐ very useful ☐ useful ☐ not useful
- Diet, Fitness, Body Fat Evaluations ☐ very useful ☐ useful ☐ not useful
- Other (specify) _____ ☐ very useful ☐ useful ☐ not useful

Please indicate what changes, if any, you made to reduce your health risks:

Diet (reduce calories, cholesterol, excess fat) ☐ no change needed ☐ no change made ☐ made some change* ☐ significant change*

*Indicate change _____

Body Weight (body fat) ☐ no change needed ☐ no change made ☐ made some change* ☐ significant change*

*Indicate change _____

Blood Pressure ☐ no change needed ☐ no change made ☐ made some change* ☐ significant change*

*Indicate change _____

Stress Reduction (relaxation) ☐ no change needed ☐ no change made ☐ made some change* ☐ significant change*

*Indicate change _____

Smoking ☐ no change needed ☐ no change made ☐ made some change* ☐ significant change*

*Indicate change _____

Exercise ☐ no change needed ☐ no change made ☐ made some change* ☐ significant change*

*Indicate change _____

Alcohol ☐ no change needed ☐ no change made ☐ made some change* ☐ significant change*

*Indicate change _____

Seatbelts ☐ no change needed ☐ no change made ☐ made some change* ☐ significant change*

*Indicate change _____

Other (specify) _____ ☐ no change needed ☐ no change made ☐ made some change* ☐ significant change*

*Indicate change _____

Check additional follow-up services you would be interested in, if available:

- ☐ diet counseling ☐ alcohol control ☐ exercise programs ☐ weight control ☐ drug counseling ☐ fitness testing
- ☐ medical self help ☐ stop smoking ☐ other (specify) _____

If you have comments or suggestions concerning this project, please write them on the back of this sheet. Thank you for participating in Project Life/Style.

Please return this form to:
Rouie Saylor, Equipment Development Center,
Building 1, Fort Missoula, Missoula, Montana

Appendix E

Government Regulations for Periodic Screening and Testing

"Periodic screening and testing is performed for the detection of unknown diabetes, visual defects, glaucoma, cancer, hypertension, hearing defects, etc. These programs will be performed only on a voluntary basis. Employees are referred to their private physicians for final diagnosis and/or treatment if the screening or testing program indicates the possible presence of disease." (DHEW Pub. (HSA) 77-2033)

Appendix F

Key Contacts

Dept. of Health and Human Services
Dr. Lawrence W. Green, director
Office of Health, Information and Health Promotion
Washington, D.C. 20201
8-472-5370

Public Health Service
Abraham Wolfthal, deputy-director
Division of Federal Employee
Occupational Health
Washington, D.C. 20201
8-436-6631

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